portion of the useful layer so as to form an interlayer between the buffer structure and the new useful layer, with the interlayer optionally being provided by layer growth.

14. (original) The method of claim 13, wherein the interlayer includes

(a) a material selected from the group consisting of SiGe and strained Si;

(b) a material selected from the group consisting of AsGa and/or Ge;

(c) an alloy of Group III V elements; or

(d) a material selected from the group consisting of InP and a Group III-V material having a lattice parameter substantially identical to that of InP.

15. (original) The method of claim 13, wherein the buffer structure has a composition that includes an atomic alloy of binary, ternary, quaternary or of higher degree, selected from the group consisting of Group IV-IV elements; Group III-V elements, and Group II-VI elements.

16. (original) The method of claim 1, wherein

(a) the substrate includes Si and the buffer structure includes a SiGe buffer layer having a Ge concentration that increases with thickness and a relaxed SiGe layer on the buffer layer;

(b) the substrate includes AsGa and the buffer structure comprises a buffer layer comprising an atomic alloy of Group III V elements of ternary or higher degree that is selected from possible (Al,Ga,In) (N,P,As) combinations with at least two additional elements selected from the group consisting of Group III and Group V elements, wherein the two additional elements have a concentration that changes gradually with thickness of the buffer layer;

(c) the donor wafer has at least one layer that includes carbon with a carbon concentration in the layer which is less than or equal to about 50%; or

(d) the donor wafer has at least one layer that includes carbon with a carbon concentration in the layer which is less than or equal to about 5%.

17. (original) The method of claim 1, which further comprises:
providing a zone of weakness beneath the donor wafer surface;
bonding the donor wafer surface to a surface of a receiving substrate; and
detaching a useful layer from the donor wafer along the zone of weakness.